

## Appendix 1.

### Analysis of immunogenic regions of PspA protein from *S. Pneumoniae* strain Rx1.

Immunogenic regions are indicated by asterisks underneath the sequence.

111172	111173	21	111174	111175	111176	111177	111178	111179	111180	111181	111182	111183	111184	111185	111186	111187	111188	111189	111190	111191	111192	111193	111194	111195	111196	111197	111198	111199	111200
111172	111173	21	111174	111175	111176	111177	111178	111179	111180	111181	111182	111183	111184	111185	111186	111187	111188	111189	111190	111191	111192	111193	111194	111195	111196	111197	111198	111199	111200

Name: surface protein pspA precursor - Streptococcus pneumoniae

Organism: (Streptococcus pneumoniae)

Time and Date: 3:15 pm, March 27, 2000

References: Reference 1:

Journal: J. Bacteriol. (1992) 174:601-609

Residues: 1-619

Reference 2:

Journal: Infect. Immun. (1991) 59:1285-1289

Residues: 32-76

10 20 30 40 50  
1 EESPVASQSKAEKDYDAKKDAKNAKKAVERDAQKALDDAKAAQKKYDEDQ 50  
5\*\*\*\*\* 52  
3\*\*\*\*\* 29\*\*\*\*\*  
10 20 30 40 50  
51 KKTEEKAALKAASEEMDKAVAAVQQAYLAYQQATDKAAKDAADKMIDEA 100  
\*\*\*\*\* 66\*\*\*\*\* 73\*\*\*\*\*  
78\*\*  
10 20 30 40 50  
101 KKREEEAKTKFNTVVRAMVPEPEQLAETKKKSEEAKQKAPELTKKLEEA 150  
91\*\*\*\*\* 95\*\*\*\*\* 123\*\*\*\*\*  
\*\*\*\* 101\*\*\*\* 122\*\*\*\*\*  
89\*\*\*\*\* 116\*\*\*\*\*  
10 20 30 40 50  
151 AKLEEAEEKKATEAKQKVDAREVAPQAKIAELENQVHRLEQELKEIDSESES 200  
133\*\*\*\*\* 140\*\*\*\*\* 15  
130\*\*\*\*\* 145\*\*\*\*\*  
10 20 30 40 50  
201 EDYAKEGFRAPLQSKLDAKKAKLSKLEELSDKIDELDAEIAKLEDQLKAA 250  
8\*\*\*\*\* 168\*\*\*\*\*  
166\*\*\*\*\* 1  
10 20 30 40 50  
251 EENNVEDYFKEGLEKTIAAKKAELEKTEADLKKAVNEPEKPAPAPETPA 300  
179\*\*\*\*\* 185\*\*\*\*\* 206\*\*\*\*\*  
76\*\*\*\*\* 182\*\*\*\*\* 195\*\*\*\*\*

199\*\*\*\*\*

	10	20	30	40	50	
301	PEAPAEQPKPAPAPQAPAPKPEKPAEQPKPEKTTDDQQAEDYARRSEEE					350
	10	20	30	40	50	
351	YNRLTQQQPRKAEPAPAPKTGWKQENGWYFYNTDGSMATGWLQNNGSW					400
	10	20	30	40	50	
401	YYLNSNGAMATGWLQYNGSWYYLNANGAMATGWAKVNGSWYYLNANGAMA					450
	10	20	30	40	50	
451	TGWLQYNGSWYYLNANGAMATGWAKVNGSWYYLNANGAMATGWLQYNGSW					500
	10	20	30	40	50	
501	YYLNANGAMATGWAKVNGSWYYLNANGAMATGWVKDGDWYYLEASGAMK					550
	10	20	30	40	50	
551	ASQWFKVSDKWYYVNLGALAVNTTVDGYKVNANGEWV					588

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Motif #: 3                      Range: 6 - 13

Motif:    \* [DEGHKNPQRST] [DEHGKNPQRST] [DEHGKNPQRST] [DEHGKNPQRST] \* [DEHGK  
QRST]\*

Ref.: WISHART, D.S. UNPUBLISHED

Name: GENERALIZED B CELL EPITOPE PATTERN

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Motif #: 5                      Range: 8 - 15

Motif:    \* [DEGHKNPQRST] [DEHGKNPQRST] \* [DEHGKNPQRST] [DEHGKNPQRST] [DEHGK

[illegible]

Name: GENERALIZED B CELL EPIOTOPE PATTERN

Motif #: 91 Range: 107 - 114  
 Motif: \* [DEGHKNPQRST] [DEHGKNPQRST] [DEHGKNPQRST] \* [DEHGKNPQRST] [DEHGK  
 QRST] \*  
 Ref.: WISHART, D.S. UNPUBLISHED  
 Name: GENERALIZED B CELL EPITOPE PATTERN

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Motif #: 95 Range: 119 - 125  
 Motif: \* [DEGHKNPQRST] [DEHGKNPQRST] [DEHGKNPQRST] [DEHGKNPQRST] [DEHGKN  
 RST] \*  
 Ref.: WISHART, D.S. UNPUBLISHED  
 Name: GENERALIZED B CELL EPITOPE PATTERN

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Motif #: 101 Range: 127 - 133  
 Motif: \* [DEGHKNPQRST] [DEHGKNPQRST] [DEHGKNPQRST] [DEHGKNPQRST] [DEHGKN  
 RST] \*  
 Ref.: WISHART, D.S. UNPUBLISHED  
 Name: GENERALIZED B CELL EPITOPE PATTERN

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Motif #: 116 Range: 132 - 139  
 Motif: \* [DEGHKNPQRST] [DEHGKNPQRST] \* [DEHGKNPQRST] [DEHGKNPQRST] [DEHGK  
 QRST] \*  
 Ref.: WISHART, D.S. UNPUBLISHED  
 Name: GENERALIZED B CELL EPITOPE PATTERN

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Motif #: 122 Range: 139 - 146  
 Motif: \* [DEGHKNPQRST] [DEHGKNPQRST] \* [DEHGKNPQRST] [DEHGKNPQRST] [DEHGK  
 QRST] \*  
 Ref.: WISHART, D.S. UNPUBLISHED  
 Name: GENERALIZED B CELL EPITOPE PATTERN

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Motif #: 123 Range: 142 - 149  
 Motif: \* [DEGHKNPQRST] [DEHGKNPQRST] [DEHGKNPQRST] \* [DEHGKNPQRST] [DEHGK  
 QRST] \*  
 Ref.: WISHART, D.S. UNPUBLISHED  
 Name: GENERALIZED B CELL EPITOPE PATTERN

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Motif #: 130 Range: 153 - 160  
 Motif: \* [DEGHKNPQRST] [DEHGKNPQRST] \* [DEHGKNPQRST] [DEHGKNPQRST] [DEHGK  
 QRST] \*  
 Ref.: WISHART, D.S. UNPUBLISHED

[illegible]

Motif #: 166 Range: 226 - 233

Motif: \* [DEGHKNPQRST] [DEHGKNPQRST] \* [DEHGKNPQRST] [DEHGKNPQRST] [DEHGKNPQRST] \*  
QRST] \*

Ref.: WISHART, D.S. UNPUBLISHED

Name: GENERALIZED B CELL EPITOPE PATTERN

Motif #: 168 Range: 229 - 236

Motif: \* [DEGHKNPQRST] [DEHGKNPQRST] [DEHGKNPQRST] \* [DEHGKNPQRST] [DEHGKNPQRST] \*

Ref.: WISHART, D.S. UNPUBLISHED

Name: GENERALIZED B CELL EPITOPE PATTERN

Motif #: 176 Range: 250 - 256

Motif: \* [DEGHKNPQRST] [DEHGKNPQRST] [DEHGKNPQRST] [DEHGKNPQRST] [DEHGKN  
RST] \*

OPTIMIZATION	FE	FE/2	FE/4	FE/8	FE/16	FE/32	FE/64	FE/128	FE/256	FE/512	FE/1024	FE/2048	FE/4096	FE/8192	FE/16384	FE/32768	FE/65536	FE/131072	FE/262144	FE/524288	FE/1048576	FE/2097152	FE/4194304	FE/8388608	FE/16777216	FE/33554432	FE/67108864	FE/134217728	FE/268435456	FE/536870912	FE/1073741824	FE/2147483648	FE/4294967296	FE/8589934592	FE/17179869184	FE/34359738368	FE/68719476736	FE/137438953472	FE/274877906944	FE/549755813888	FE/1099511627776	FE/2199023255552	FE/4398046511104	FE/8796093022208	FE/17592186044416	FE/35184372088832	FE/70368744177664	FE/140737488355328	FE/281474976710656	FE/562949953421312	FE/1125899906842624	FE/2251799813685248	FE/4503599627370496	FE/9007199254740992	FE/18014398509481984	FE/36028797018963968	FE/72057594037927936	FE/144115188075855872	FE/288230376151711744	FE/576460752303423488	FE/1152921504606846976	FE/2305843009213693952	FE/4611686018427387904	FE/9223372036854775808	FE/18446744073709551616	FE/36893488147419103232	FE/73786976294838206464	FE/147573952589676412928	FE/295147905179352825856	FE/590295810358705651712	FE/1180591620717411303424	FE/2361183241434822606848	FE/4722366482869645213696	FE/9444732965739290427392	FE/18889465931478580854784	FE/37778931862957161709568	FE/75557863725914323419136	FE/151115727451828646838272	FE/302231454903657293676544	FE/604462909807314587353088	FE/1208925819614629174706176	FE/2417851639229258349412352	FE/4835703278458516698824704	FE/9671406556917033397649408	FE/19342813113834066795298816	FE/38685626227668133590597632	FE/77371252455336267181195264	FE/154742504910672534362390528	FE/309485009821345068724781056	FE/618970019642690137449562112	FE/1237940039285380274899124224	FE/2475880078570760549798248448	FE/4951760157141521099596496896	FE/9903520314283042199192993792	FE/19807040628566084398385987584	FE/39614081257132168796771975168	FE/79228162514264337593543950336	FE/158456325028528675187087900672	FE/316912650057057350374175801344	FE/633825300114114700748351602688	FE/1267650600228229401496703205376	FE/2535301200456458802993406410752	FE/5070602400912917605986812821504	FE/10141204801825835211973625643008	FE/20282409603651670423947251286016	FE/40564819207303340847894502572032	FE/81129638414606681695789005144064	FE/162259276829213363391578010288128	FE/324518553658426726783156020576256	FE/649037107316853453566312041152512	FE/1298074214633706907132624082305024	FE/2596148429267413814265248164610048	FE/5192296858534827628530496329220096	FE/10384593717069655257060992658440192	FE/20769187434139310514121985316880384	FE/41538374868278621028243970633760768	FE/83076749736557242056487941267521536	FE/166153499473114484112975882535043072	FE/332306998946228968225951765070086144	FE/664613997892457936451903530140172288	FE/1329227995784915872903807060280344576	FE/2658455991569831745807614120560689152	FE/5316911983139663491615228241121378304	FE/10633823966279326983230456482242756608	FE/21267647932558653966460912964485513216	FE/42535295865117307932921825928971026432	FE/85070591730234615865843651857942052864	FE/170141183460469231731687303715884105728	FE/340282366920938463463374607431768211456	FE/680564733841876926926749214863536422912	FE/1361129467683753853853498429727072845824	FE/2722258935367507707706996859454145691648	FE/5444517870735015415413993718908291383296	FE/10889035741470030830827987437816582766592	FE/21778071482940061661655974875633165533184	FE/43556142965880123323311949751266331066368	FE/87112285931760246646623899502532662132736	FE/174224571863520493293247799005065324265472	FE/348449143727040986586495598010130648530944	FE/696
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Motif #: 179 Range: 252 - 259

Ref.: WISHART, D.S. UNPUBLISHED

Motif #: 182 Range: 260 - 267

Ref.: WISHART, D.S. UNPUBLISHED

Motif #: 185 Range: 261 - 268

Ref.: WISHART, D.S. UNPUBLISHED

Motif #: 195 Range: 275 - 282

Ref.: WISHART, D.S. UNPUBLISHED

Motif #: 199 Range: 281 - 290

Ref.: ROTHBARD, J.B. ET AL., EMBO J. 7:93-101 (1988)

Motif #: 206 Range: 288 - 295

Ref.: WISHART, D.S. UNPUBLISHED

Name: GENERALIZED B CELL EPITOPE PATTERN